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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/612,149	07/03/2003	Takeshi Masuda	026390-00009	3313
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ARENT FOX LLP 1050 CONNECTICUT AVENUE, N.W. SUITE 400 WASHINGTON, DC 20036			EXAMINER ZERVIGON, RUDY	
			ART UNIT 1792	PAPER NUMBER
			NOTIFICATION DATE 11/30/2007	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/612,149	Applicant(s) MASUDA ET AL.	
	Examiner Rudy Zervigon	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 September 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6, 8-11 and 13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-11 and 13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 April 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-6, 8, 10, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okase; Wataru (US 5,884,009 A). Okase teaches a film-forming apparatus (Figure 7; column 15, lines 6-67) in which a gas mixture (from 75a,b; Figure 7) prepared in a gas-mixing chamber (volume between 7a,b; Figure 7; column 15, lines 6-67) is introduced into a film-forming chamber (volume within 7c+piece containing 45; Figure 7; column 15, lines 6-67) through a shower head (7c; Figure 7; column 15, lines 6-67) to form on a substrate (W; Figure 7), the apparatus comprising the gas-mixing chamber (volume between 7a,b; Figure 7; column 15, lines 6-67) for admixing a raw gas (75a,b; Figure 7; column 15, lines 6-67) and a reactive gas (75a,b; Figure 7; column 15, lines 6-67), the film-forming chamber (volume within 7c+piece containing 45; Figure 7; column 15, lines 6-67) connected to the gas-mixing chamber (volume between 7a,b; Figure 7; column 15, lines 6-67), the shower head (7c; Figure 7; column 15, lines 6-67) disposed on the top face of the film-forming chamber (volume within 7c+piece containing 45; Figure 7; column 15, lines 6-67), a stage (61; Figure 7; column 15, lines 6-7) arranged in the film-forming chamber (volume within 7c+piece containing 45; Figure 7; column 15, lines 6-67) for placing the substrate (W; Figure 7) to be processed and capable of freely going up and down (60, 64; Figure 7; column 14; lines 30-45) and a supply port disposed at the peripheral portion

(perimeter 73b; Figure 7 - 72 permits radial flow - column 15, lines 17-25) on the bottom face of the gas-mixing chamber (volume between 7a,b; Figure 7; column 15, lines 6-67) supplying the gas mixture (from 75a,b; Figure 7) prepared in the gas mixing chamber (volume between 7a,b; Figure 7; column 15, lines 6-67) directly to the top face of the shower head (7c; Figure 7; column 15, lines 6-67) such that the gas (75a,b; Figure 7; column 15, lines 6-67) mixture prepared in the gas-mixing chamber (volume between 7a,b; Figure 7; column 15, lines 6-67) and fed to the shower head (7c; Figure 7; column 15, lines 6-67) through the peripheral portion (perimeter 73b; Figure 7 - 72 permits radial flow - column 15, lines 17-25) on the top face of the shower head (7c; Figure 7; column 15, lines 6-67) flows towards the central portion of the shower head (7c; Figure 7; column 15, lines 6-67), wherein an exhaust port (45; Figure 7) for discharging the exhaust gas (75a,b; Figure 7; column 15, lines 6-67) from the film-forming chamber (volume within 7c+piece containing 45; Figure 7; column 15, lines 6-67) is formed in the side wall (block containing 45; Figure 7) of the film-forming chamber (volume within 7c+piece containing 45; Figure 7; column 15, lines 6-67) at a position located below the level of the stage (61; Figure 7; column 15, lines 6-7) at an up position and having an opening (radial direction) extending in a direction that is parallel relative to the direction in which the stage is raised and lowered - claim

1. Applicant's amended claim requirements of "so that the distance between the shower head (7c; Figure 7; column 15, lines 6-67) and the substrate (W; Figure 7) to be processed (S/S distance) satisfies the following relation: $25\text{mm} \leq \text{S/S distance} \leq 35\text{mm}$ " and wherein the distance between the showerhead and the substrate to be processed (S/S distance) and a diameter of the showerhead satisfies the following relation: $(\text{S/S distance}) \times 5 < (\text{diameter of the showerhead}) < (\text{S/S distance}) \times 10$, are claim requirements of intended use in the pending apparatus claims

because the claimed "S/S distance" depends on the geometry of the processed substrate which is not considered part of the claimed apparatus. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP 2111.02).

Okase further teaches:

- i. The film-forming apparatus (Figure 7; column 15, lines 6-67) as set forth in claim 1, wherein the exhaust gas (75a,b; Figure 7; column 15, lines 6-67) generated in the film-forming chamber (volume within 7c+piece containing 45; Figure 7; column 15, lines 6-67) is directed and guided towards the side wall (block containing 45; Figure 7) of the chamber and discharged through the exhaust port (45; Figure 7) arranged on the side wall (block containing 45; Figure 7), as claimed by claim 2
- ii. The film-forming apparatus (Figure 7; column 15, lines 6-67) as set forth in claim 1 or 2, wherein when the flow rate of the gas (75a,b; Figure 7; column 15, lines 6-67) mixture is large, the shower conductance is small and the gas (75a,b; Figure 7; column 15, lines 6-67) mixture is injected into the film-forming chamber (volume within 7c+piece containing 45; Figure 7; column 15, lines 6-67) from the central portion of the shower head (7c; Figure 7; column 15, lines 6-67) (hereunder referred to as "central gas (75a,b;

Figure 7; column 15, lines 6-67) injection") upon the formation of a film, the apparatus (Figure 7; column 15, lines 6-67) is so designed that it comprises a shower head (7c; Figure 7; column 15, lines 6-67) having a large diameter, that the distance between the shower head (7c; Figure 7; column 15, lines 6-67) and the substrate (W; Figure 7) to be processed is increased or that a shower head (7c; Figure 7; column 15, lines 6-67) having a large diameter is used and the distance between the shower head (7c; Figure 7; column 15, lines 6-67) and the substrate (W; Figure 7) to be processed is increased, to thus prevent the central gas (75a,b; Figure 7; column 15, lines 6-67) injection of the gas (75a,b; Figure 7; column 15, lines 6-67) mixture and to make the manner of a gas (75a,b; Figure 7; column 15, lines 6-67) injection of the gas (75a,b; Figure 7; column 15, lines 6-67) mixture uniform, as claimed by claim 3. The entirety of Applicant's claim 3 is an intended use of the pending apparatus claims. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP 2111.02).

- iii. The film-forming apparatus (Figure 7; column 15, lines 6-67) as set forth in claim 1 or 2, wherein when the flow rate of the gas (75a,b; Figure 7; column 15, lines 6-67) mixture is small, the shower conductance is large and the gas (75a,b; Figure 7; column 15, lines 6-

67) mixture is injected into the film-forming chamber (volume within 7c+piece containing 45; Figure 7; column 15, lines 6-67) from a shower head (7c; Figure 7; column 15, lines 6-67) and into a region above a substrate (W; Figure 7) to be processed from the periphery of the shower head (7c; Figure 7; column 15, lines 6-67) (hereunder referred to as "peripheral gas (75a,b; Figure 7; column 15, lines 6-67) injection") upon the formation of a film, the apparatus (Figure 7; column 15, lines 6-67) is so designed that it comprises a shower head (7c; Figure 7; column 15, lines 6-67) having a small diameter, that the distance between the shower head (7c; Figure 7; column 15, lines 6-67) and the substrate (W; Figure 7) to be processed is reduced or that a shower head (7c; Figure 7; column 15, lines 6-67) having a small diameter is used and the distance between the shower head (7c; Figure 7; column 15, lines 6-67) and the substrate (W; Figure 7) to be processed is reduced, to thus prevent the peripheral gas (75a,b; Figure 7; column 15, lines 6-67) injection of the gas (75a,b; Figure 7; column 15, lines 6-67) mixture and to make the manner of the gas (75a,b; Figure 7; column 15, lines 6-67) injection of the gas (75a,b; Figure 7; column 15, lines 6-67) mixture uniform, as claimed by claim 4. The entirety of Applicant's claim 4 is an intended use of the pending apparatus claims. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the

claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto, 136 USPQ 458, 459 (CCPA 1963); MPEP 2111.02).

- iv. The film-forming apparatus (Figure 7; column 15, lines 6-67) as set forth in claim 1, wherein a gas ring (76; Figure 7; column 14; lines 30-45) is disposed at the periphery of the top face of the film-forming chamber (volume within 7c+piece containing 45; Figure 7; column 15, lines 6-67) so that an inert gas (77; Figure 7; column 15, lines 6-67), which is not directly involved in the film formation, can uniformly be introduced into the film-forming chamber (volume within 7c+piece containing 45; Figure 7; column 15, lines 6-67) through the gas ring (76; Figure 7; column 14; lines 30-45) and along the inner surface of the side wall of the film-forming chamber (volume within 7c+piece containing 45; Figure 7; column 15, lines 6-67), as claimed by claim 11

Okase does not teach and wherein the diameter of the shower head satisfies the following relation: $200\text{mm} \leq \text{diameter of the shower head} \leq 250\text{mm}$ - claim 1

Okase does not teach the relative dimensions of Okase's showerhead (7c; Figure 7; column 15, lines 6-67) diameter vs. Okase's film forming chamber (volume within 7c+piece containing 45; Figure 7; column 15, lines 6-67) diameter as claimed by claims 5. Okase does not teach the relative distance between Okase's substrate (W) and Okase's showerhead (7c; Figure 7; column 15, lines 6-67) as claimed by claims 7. Okase further does not teach the operating parameters of pressure and gas flow in the range of the claimed inequalities – claim 6, and 8-10.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize Okase's relative apparatus dimensions and Okase's operating parameters.

Motivation to optimize Okase's relative apparatus dimensions and Okase's operating parameters is for generating uniform thickness of deposited films as taught by Okase (column 13, lines 20-30). Further, it would be obvious to those of ordinary skill in the art to optimize the operation of the claimed invention (In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980); In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969); Merck & Co. Inc. v. Biocraft Laboratories Inc., 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989); In re Kulling, 897 F.2d 1147, 14 USPQ2d 1056 (Fed. Cir. 1990), MPEP 2144.05). Further it is well established that changes in apparatus dimensions are within the level of ordinary skill in the art. (Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984); In re Rose, 220 F.2d 459, 105 USPQ 237 (CCPA 1955); In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); See MPEP 2144.04)

3. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okase; Wataru (US 5,884,009 A) in view of Reimer; Paul et al. (US 6817377 B1). Okase is discussed above. Okase does not teach a film-forming apparatus (Figure 7; column 15, lines 6-67), which comprises a load-lock chamber for stocking wafers conveyed from a wafer cassette in the atmospheric conditions; a film-forming chamber (volume within 7c+piece containing 45; Figure 7; column 15, lines 6-67); a conveyer chamber positioned between the load-lock chamber and the film-forming chamber (volume within 7c+piece containing 45; Figure 7; column 15, lines 6-67) - claim 13.

Reimer teaches semiconductor processing apparatus (Figure 1) including a load-lock chamber (25c) for stocking wafers conveyed from a wafer cassette in the atmospheric conditions; a film-

forming chamber (25a); a conveyer chamber (25b) positioned between the load-lock chamber (25c) and the film-forming chamber (25a).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add Reimer's load-lock chamber (25c) and conveyer chamber (25b) to Okase's apparatus.

Motivation to add Reimer's load-lock chamber (25c) and conveyer chamber (25b) to Okase's apparatus is for process automation as taught by Reimer (column 1; lines 10-13).

Response to Arguments

4. Applicant's arguments with respect to claims 1-6, 8-11, and 13 have been considered but are moot in view of the new grounds of rejection.

Conclusion

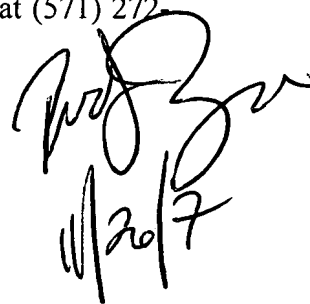
5. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272-1442. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official fax phone number for the 1792 art unit is (571) 273-8300. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the examiner can not be reached please contact the examiner's supervisor, Parviz Hassanzadeh, at (571) 272-1435.



Handwritten signature of Rudy Zervigon and date 11/20/7